BROOKLINE

DRISCOLL SCHOOL EXPANSION

School Building Advisory Committee
Design Subcommittee
Mar. 30, 2020

Jonathan Levi Architects

Agenda

1. Sustainability
2. Systems update – Electrical & Fire Protection
3. Toilet Rooms

Agenda

1. Sustainability

Sustainability – LEED Scorecard

Driscoll School: LEED Schools v4 Project Checklist

VIDARIS

Likely	Possible	Less Likely	Not Viable				
57	13	24	15	**Total (Silver Certification is targeted)**		Possible Points:	110
L	P	LL	NV				
			1	**Integrative Process**		Possible Points:	1
7		5	3	**Location and Transportation**		Possible Points:	15
			15	Credit 1	LEED for Neighborhood Development Location	15	
1				Credit 2	Sensitive Land Protection	1	
		2		Credit 3	High Priority Site	2	
2			3	Credit 4	Surrounding Density and Diverse Uses	5	
1		3		Credit 5	Access to Quality Transit	4	
1				Credit 6	Bicycle Facilities	1	
1				Credit 7	Reduced Parking Footprint	1	
1				Credit 8	Green Vehicles	1	
7	2		2	**Sustainable Sites**		Possible Points:	12
Y				Prereq 1	Construction Activity Pollution Prevention	RQD	
Y				Prereq 2	Environmental Site Assessment	RQD	
	1			Credit 1	Site Assessment	1	
			2	Credit 2	Site Development--Protect or Restore Habitat	2	
1				Credit 3	Open Space	1	
2	1			Credit 4	Rainwater Management	3	
2				Credit 5	Heat Island Reduction	2	
1				Credit 6	Light Pollution Reduction	1	
			1	Credit 7	Site Master Plan	1	
1				Credit 8	Joint Use of Facilities	1	
4		4	4	**Water Efficiency**		Possible Points:	12
Y				Prereq 1	Outdoor Water Use Reduction	RQD	
Y				Prereq 2	Indoor Water Use Reduction	RQD	
Y				Prereq 3	Building-Level Water Metering	RQD	
2				Credit 1	Outdoor Water Use Reduction	2	
2		1	4	Credit 2	Indoor Water Use Reduction	7	
		2		Credit 3	Cooling Tower Water Use	2	
		1		Credit 4	Water Metering	1	

Certified 40 points
Silver 50 points
Gold 60 points
Platinum 80 points

Developed in accordance with 3/12/20 drawings

Comments
Requires energy modeling and water system analyses prior to SD
Comments
Project is not within an ND location
Site is previously developed
Less likely unless soil contamination is present
Neighborhood density, services determine viability
Green Line stops within 1/2 mile, pts dependent on frequency of service
Bike lanes on Washington, Westbourne, covered racks, staff shower
Total parking capacity to be 30% below ITE basis of 0.25/student
2% parking (2 space minimum) to include electric charging stations
Comments
ESC drawings will address requirements
Phase I / II ESA must be performed
Existing conditions to be evaluated for compliance
30% site restoration to native/adaptive plantings, soils unlikely
Courtyards, playground, landscaped areas sufficient to earn credit
Onsite infiltration with large playfields, some structual measures
Achievable through roofing, paving material selection, limited parking
Design to be developed to meet criteria for uplight and light trespass
Not applicable to single building site design
Achievable if spaces are shared with community after school hours
Comments
No potable water used for irrigation; native/adaptive plantings
Achievable through fixture selection
All required meters to be included
No potable water used for irrigation; native/adaptive plantings
Achievable through fixture selection
Design, water testing will determine viability
Requires submetering of 2 systems (i.e.irrigation, DHW)

Sustainability – LEED Scorecard

Driscoll School: LEED Schools v4 Project Checklist

VIDARIS

17	7	6	1	**Energy and Atmosphere**	Possible Points:	31	**Comments**
Y				Prereq 1	Fundamental Commissioning and Verification	RQD	CxA will be included on team
Y				Prereq 2	Minimum Energy Performance	RQD	Design will exceed required 5% improvement over ASHRAE 90.1-2010
Y				Prereq 3	Building-Level Energy Metering	RQD	All required meters to be included
Y				Prereq 4	Fundamental Refrigerant Management	RQD	Equipment will meet requirements
3	2		1	Credit 1	Enhanced Commissioning	6	School to determine scope (Enhanced, Monitoring based, Envelope)
13	3			Credit 2	Optimize Energy Performance	16	EEMs, fossil fuel reduction evaluated with whole building modeling
		1		Credit 3	Advanced Energy Metering	1	Additional costs to meter all individual energy uses ≥ 10%
		2		Credit 4	Demand Response	2	Availability of program from local utility will determine viability
1	1	1		Credit 5	Renewable Energy Production	3	PV array on roof (points earned for 1%,5%,10%)
	1			Credit 6	Enhanced Refrigerant Management	1	Dependent on HVAC equipment, refrigerant types/charge
		2		Credit 7	Green Power and Carbon Offsets	2	School to determine viability, requires purchase of RECs and offsets

4		5	4	**Materials and Resources**	Possible Points:	13	**Comments**
Y				Prereq 1	Storage and Collection of Recyclables	RQD	Collection and storage areas required
Y				Prereq 2	Construction and Demolition Waste Management Planning	RQD	Requirements to be included in project specifications
		4	1	Credit 1	Building Life-Cycle Impact Reduction	5	Requires building LCA, demonstrable reduction possible with mass timber
1			1	Credit 2	Building Product Disclosure and Optimization - EPDs	2	1 pt achievable through product selection
1			1	Credit 3	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2	1 pt achievable through product selection
1			1	Credit 4	Building Product Disclosure and Optimization - Material Ingredients	2	1 pt achievable through product selection
1		1		Credit 5	Construction and Demolition Waste Management	2	Requires onsite separation, diversion targets of 50%,75%

11	3	2		**Indoor Environmental Quality**	Possible Points:	16	**Comments**
Y				Prereq 1	Minimum Indoor Air Quality Performance	RQD	Based on ASHRAE 62.1- 2010, airflow,exhuast measurement
Y				Prereq 2	Environmental Tobacco Smoke Control	RQD	Will require site and building signage
Y				Prereq 3	Minimum Acoustic Performance	RQD	Requires acoustical analysis of site, reverberation,mechanical noise
2				Credit 1	Enhanced Indoor Air Quality Strategies	2	Walk off mats, MERV 13 filters, neg pressurization; CO2 monitoring
3				Credit 2	Low-Emitting Materials	3	Achievable through product selection and specification
1				Credit 3	Construction Indoor Air Quality Management Plan	1	Based on SMACNA measures
1	1			Credit 4	Indoor Air Quality Assessment	2	Achievable through flush-out (1pt)or IAQ testing (2pts)
	1			Credit 5	Thermal Comfort	1	ASHRAE 55-2010 compliance, 100% shared, 50% individual controls
1		1		Credit 6	Interior Lighting	2	Lighting control option is achievable, Lighting Quality to be evaluated
3	1			Credit 7	Daylight	3	Classrooms design, glazing and lightshelves to maximize daylight
1				Credit 8	Quality Views	1	75% of regularly occupied spaces to have direct view to outdoors
		1		Credit 9	Acoustic Performance	1	Difficult to achieve HVAC background noise less than 35 dB

Sustainability – LEED Scorecard

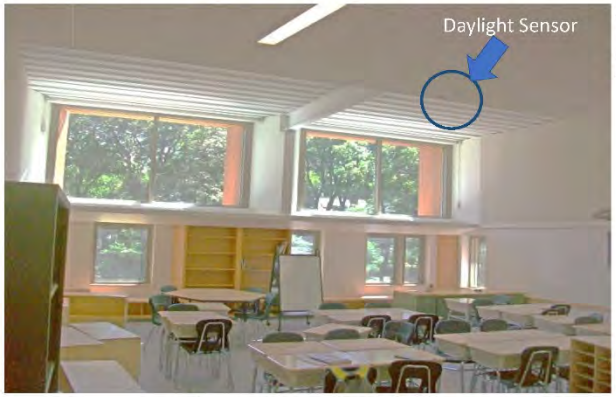
Driscoll School: LEED Schools v4 Project Checklist

6				**Innovation**	Possible Points:	6	**Comments**
1				Credit 1	ID Green Cleaning Program	1	Plan to be based on LEED Existing Building criteria
1				Credit 2	ID Integrated Pest Management Plan	1	Plan to be based on LEED Existing Building criteria
1				Credit 3	ID Occupant Comfort Survey or Design for Active Occupants	1	Survey occupants or Design to promote physical activity
1				Credit 4	ID School as a Teaching Tool / Green Education	1	Integrate sustainable features into curriculum
1				Credit 5	Pilot- Assessment and Planning for Resiliency	1	Address long-term building performance in changing climate
1				Credit 6	LEED Accredited Professional	1	Many project team members are LEED APs
1	1	2		**Regional Priority**	Possible Points:	4	**Comments**
1				Credit 1	Optimize Energy Performance (8 pts)	1	
	1			Credit 2	Renewable Energy Production (2 pts)	1	
		1		Credit 3	Building Life Cycle Impact Reduction (2 pts)	1	
		1		Credit 4	Access to Quality Transit (1 pt)	1	
57	13	24	15	**Total**	Possible Points:	110	

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

Sustainability – Daylighting

HIGH EFFICIENCY LED LIGHTING WITH OCCUPANCY SENSOR & DAYLIGHT HARVESTING



Wellington Elementary School Daylighting

Dearborn Academy Daylighting

- Dual Technology Occupancy Sensor & Daylight Photosensor
- Lighting Control System
- LPD Target of .4 to .5

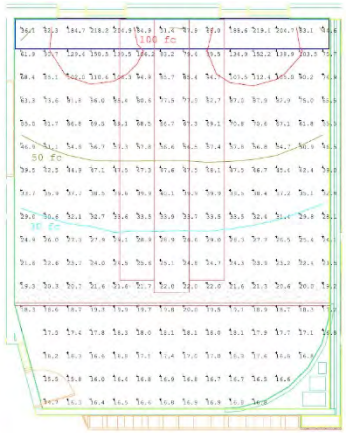
Cove Lighting

Occupancy/Daylight Sensor

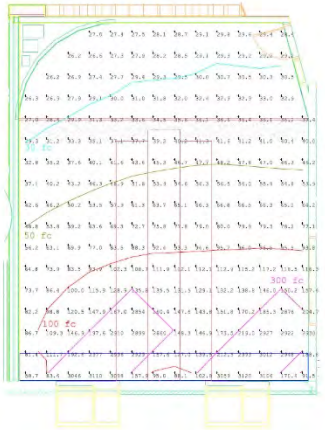
LEED V4 DAYLIGHT CREDIT REQUIREMENTS:

DEMONSTRATE THROUGH COMPUTER MODELING THAT ILLUMINANCE LEVELS WILL BE BETWEEN 30 AND 300 FOOTCANDLES FOR 9AM AND 3PM, ON A CLEAR SKY DAY AT THE EQUINOX, FOR THE FLOOR AREA INDICATED IN THE TABLE:

PERCENTAGE OF REGULARLY OCCUPIED FLOOR AREA	POINTS
75%	1
90%	2



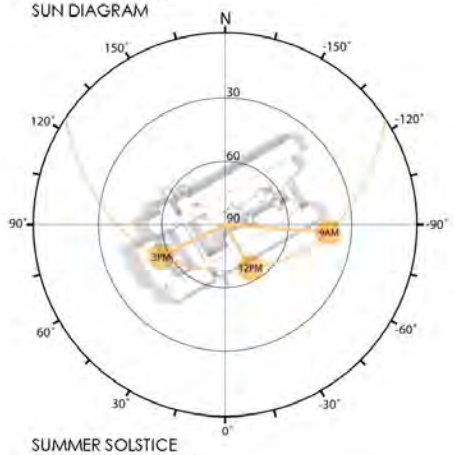
48.32 FOOTCANDLE AVERAGE,
NORTH FACING CLASSROOM WITH NATURAL LIGHTING ONLY
(MARCH 30TH, 2018 - 3:00PM, CLEAR SKY)



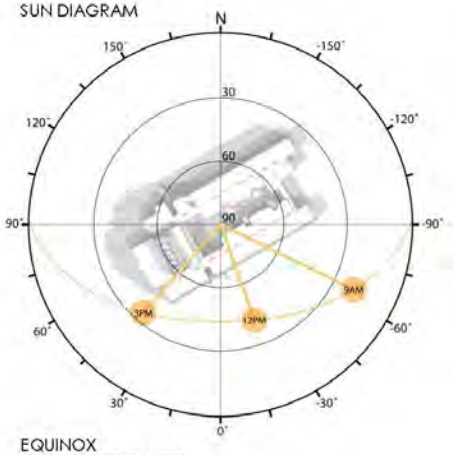
326.88 FOOTCANDLE AVERAGE,
SOUTH FACING CLASSROOM WITH NATURAL LIGHTING ONLY WITH EXTERIOR WINDOW SUNSHADES
(MARCH 30TH, 2018 - 3:00PM, CLEAR SKY)

Sustainability – Daylighting

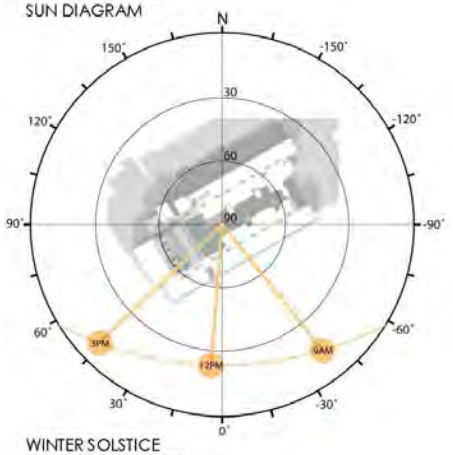
SUMMER SOLSTICE
SUN DIAGRAM



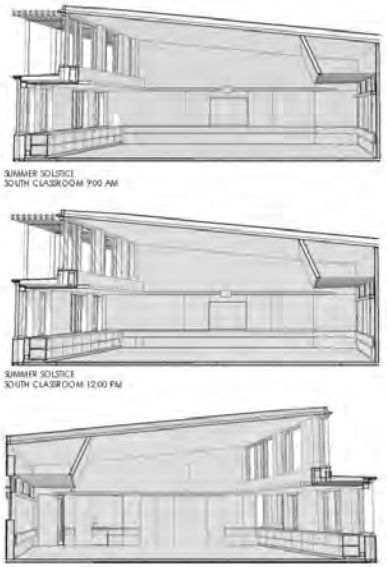
EQUINOX
SUN DIAGRAM



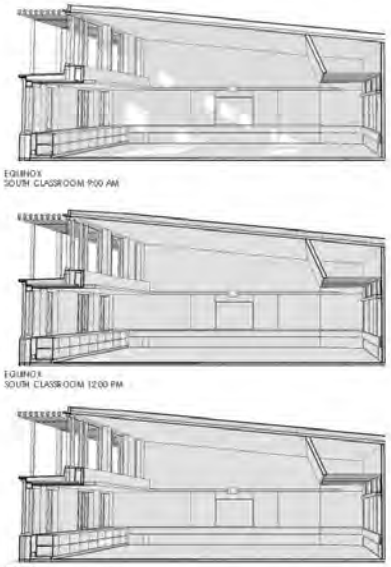
WINTER SOLSTICE
SUN DIAGRAM



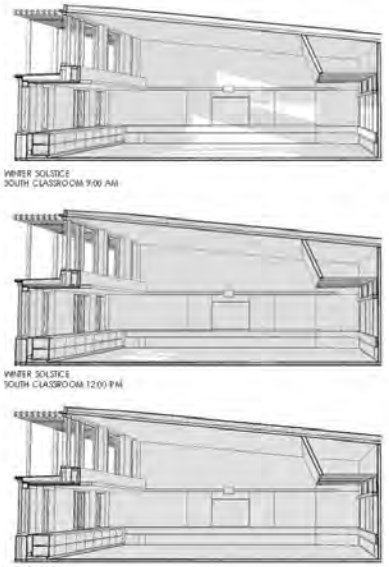
SUMMER SOLSTICE
SUPPORTING IMAGES



EQUINOX
SUPPORTING IMAGES



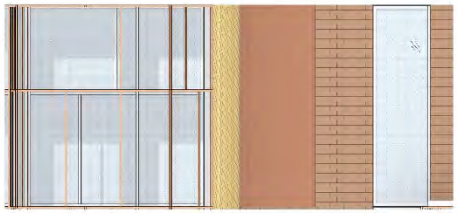
WINTER SOLSTICE
SUPPORTING IMAGES



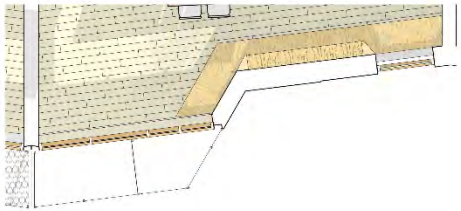
Sustainability – Daylighting

Sustainability – Daylighting

EXTERIOR ELEVATION - SIDE



EXTERIOR ELEVATION - FRONT



PLAN OF TYPICAL CLASSROOM WINDOW BAY

3D VIEW OF CLASSROOM FENETRATION / SOLAR SHADING

CLASSROOM FENETRATION/ SOLAR SHADING

0' 4' 8' 16' 32'

Jonathan Levi Architects

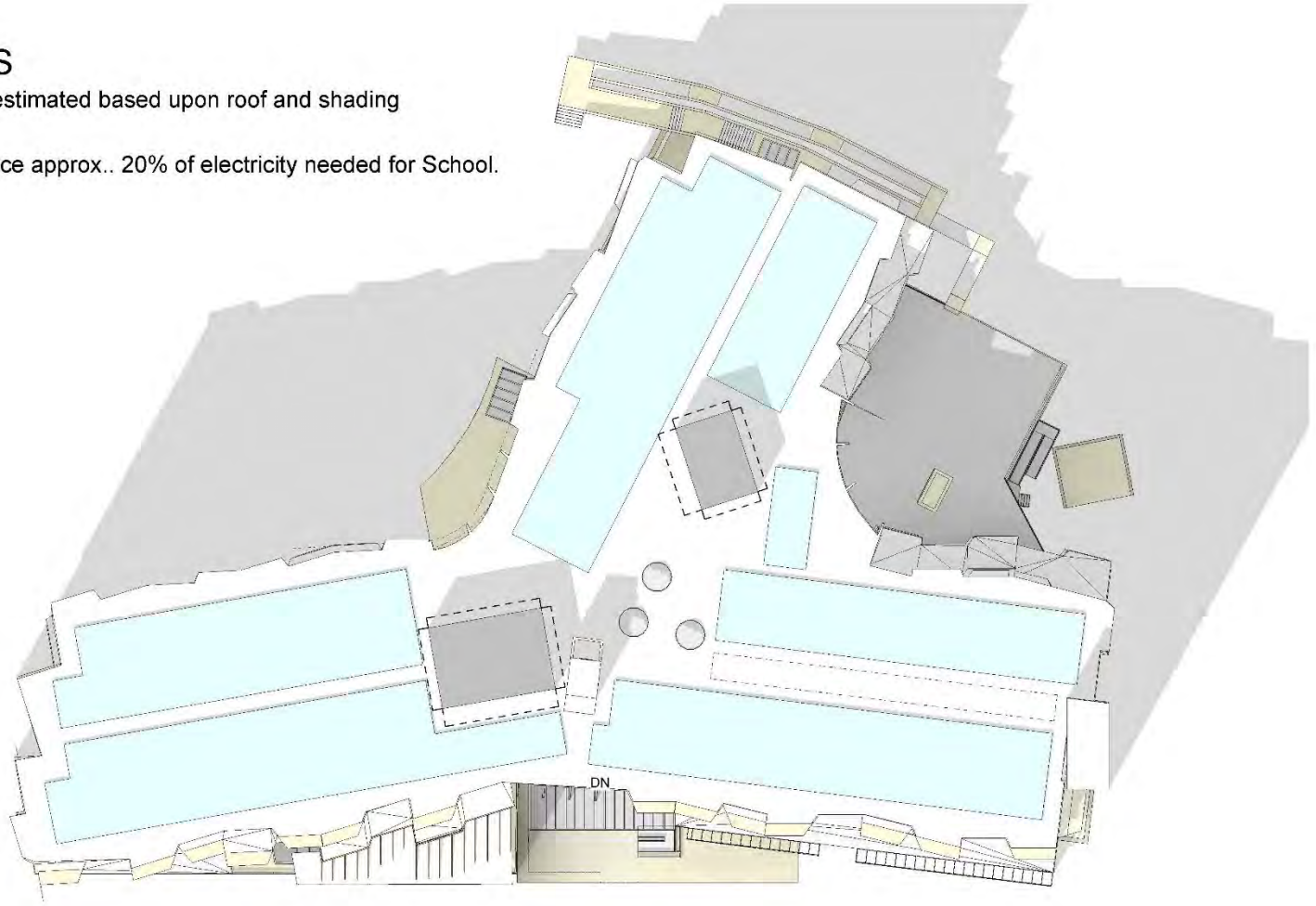
MARCH 30. 2020
DESIGN DEVELOPMENT WORKSHOP 5
DRISCOLL SCHOOL

Sustainability – Photovoltaic Energy

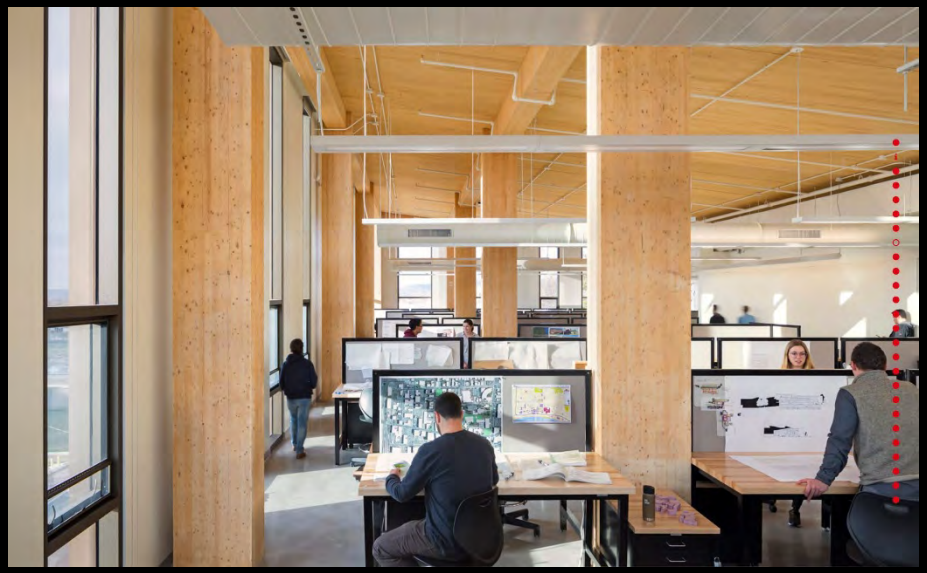
PV SYSTEMS

- 180 KW PV array estimated based upon roof and shading

- PV array will produce approx.. 20% of electricity needed for School.



Sustainability – Mass Timber



Sustainability – Mass Timber

Embodied Carbon Materials Comparison

		Quartz Project - Global Warming Potential						
		Cradle-to-gate LCA Results		End-of-life LCA Results		Combined LCA Results (Not including Installation + Use Phases)		
#	Material Type	kg CO2e	%	kg CO2e	%	kg CO2e	%	Rank Low to High
1	Ready-mix Concrete, NW (3,000 - 4,000 psi)	0.2420	--	0.0265	--	0.2685	--	7
	No slag or flyash	1 kg of product		55% for recovery; 45% landfilled				
2	Ready-mix Concrete, NW (3,000 - 4,000 psi)	0.1940	80%	0.0265	100%	0.2205	82%	6
	35% Flyash replacement	1 kg of product		55% for recovery; 45% landfilled				
3	Ready-mix Concrete, NW (3,000 - 4,000 psi)	0.1420	59%	0.0265	100%	0.1685	63%	5
	70% GGBFS replacement	1 kg of product		55% for recovery; 45% landfilled				
4	Glulam structure	(1.4300)	-591%	0.6640	2506%	(0.7660)	-285%	2
		1 kg of product		17.5% incinerated; 17.5% recycled; 65% to landfill				
5	Cross-laminated Timber	(1.1500)	-475%	0.6340	2392%	(0.5160)	-192%	3
		1 kg of product		17.5% incinerated; 17.5% recycled; 65% to landfill				
6	Medium Density Fiberboard	(0.9230)	-381%	0.6350	2396%	(0.2880)	-107%	4
		1 kg of product		17.5% incinerated; 17.5% recycled; 65% to landfill				
7	Plywood	(1.5300)	-632%	0.6650	2509%	(0.8650)	-322%	1
		1 kg of product		17.5% incinerated; 17.5% recycled; 65% to landfill				
8	Anodized Aluminum Curtainwall	6.5700	2715%	(4.3000)	-16226%	2.2700	845%	11
	29% post-consumer recycled content	1 kg of product		95% recovered, 5% landfilled				
9	Double-pane IGU	2.7000	1116%	0.0688	260%	2.7688	1031%	12
	3.56% aluminum scrap content	1 kg of product		100% to landfill				
10	Steel I-beams	0.9380	388%	0.2270	857%	1.1650	434%	9
	100% post-consumer recycled content	1 kg of product		97.5% recycled, 2.5% to landfill				
11	Steel stud	2.3600	975%	(0.7880)	-2974%	1.5720	585%	10
	45% post-consumer recycled content	1 kg of product		97.5% recycled, 2.5% to landfill				
12	Gypsum wallboard	0.3640	150%	0.0872	329%	0.4512	168%	8
	Natural gypsum	1 kg of product		100% landfilled				

Prepared by Vidaris Inc.

Agenda

1. Sustainability
2. Systems – Electrical & Fire Protection

Workshop 5 – Systems

PLUMBING SYSTEMS

Water Conserving Fixtures:

- Water Closets w/ 1.28 gpf
- Urinals w/ 0.125 gpm
- Lavatories w/ 0.35 gpm faucet
- Staff/Classroom Sinks w/manual 0.5 GPM faucet
- Accessible shower w/1.5 GPM shower head
- Water Coolers with Bottle Fillers

* Point of use electric for remote toilets

- Water Sub-Meters with integration into Building Energy Management System

- High Efficiency Domestic Hot Water heat pump System with Storage Tank and Circulator Pump

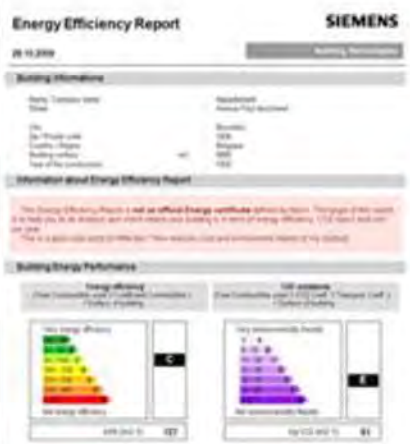
GGD

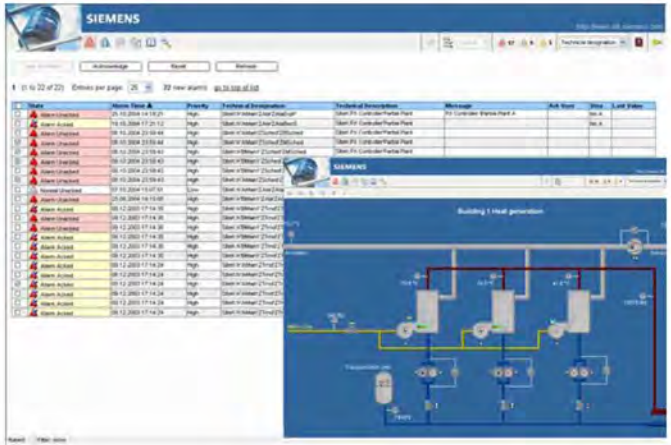
Workshop 5 – Systems

BUILDING AUTOMATION AND ENERGY MANAGEMENT SYSTEM

BUILDING DASHBOARD SYSTEM Johnson Metasys

- Utility Data
- On-Site Generation System
- Submetering
- Water and electric meters





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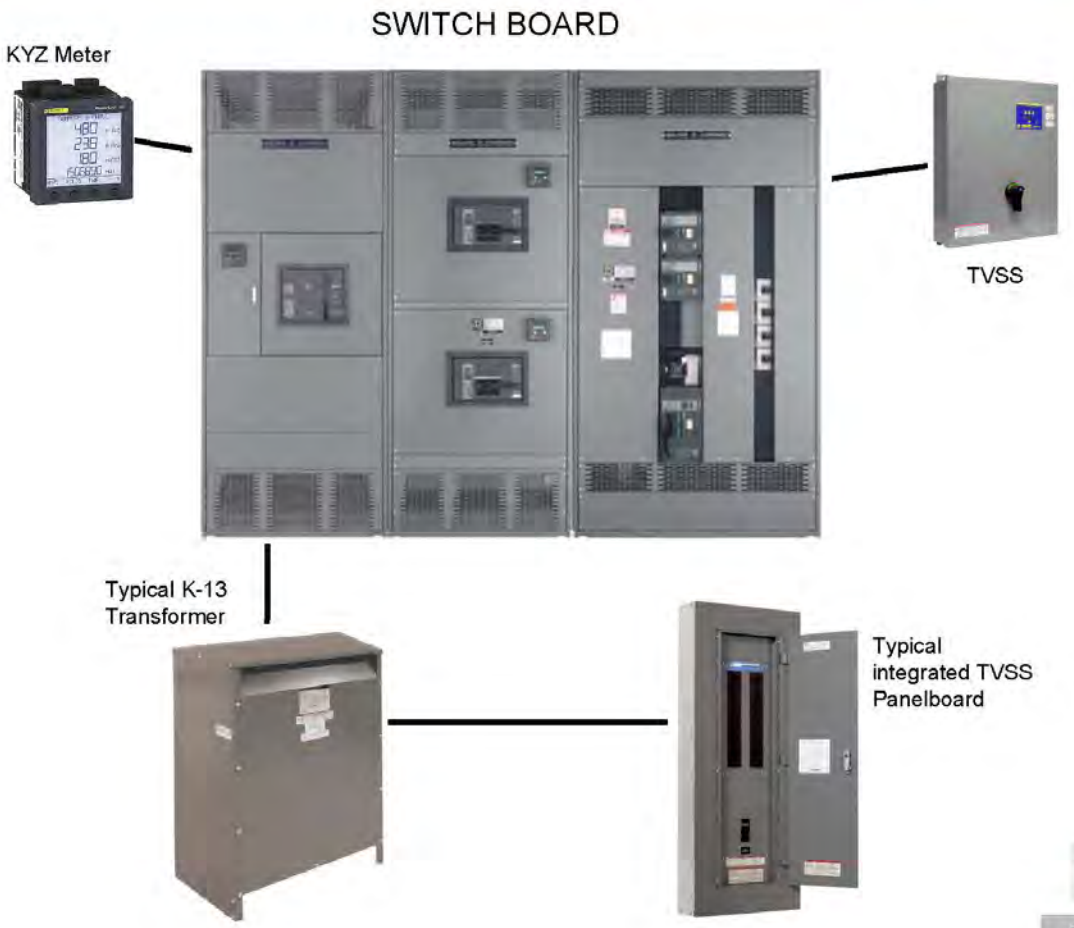
Workshop 5 – Systems

POWER DISTRIBUTION SYSTEM

- Power Switchgear
- Power Panelboard
- Transient Voltage Surge Suppressor (TVSS)
- K-13 Transformer
- KYZ Meter



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Workshop 5 – Systems

HIGH EFFICIENCY LED LIGHTING WITH OCCUPANCY SENSOR & DAYLIGHT HARVESTING

- Local Dual Technology Occupancy Sensor & Daylight Photosensor
- Lighting Control System
- LPD Target of 0.4 to .5
- Low light power density (LPD) 40% below code
- Lower LPD improves HVAC system efficiency
- Energy reduction by harvesting natural daylight
- 90% reflective ceiling surface for improved light levels

Daylight/Occupancy Sensor

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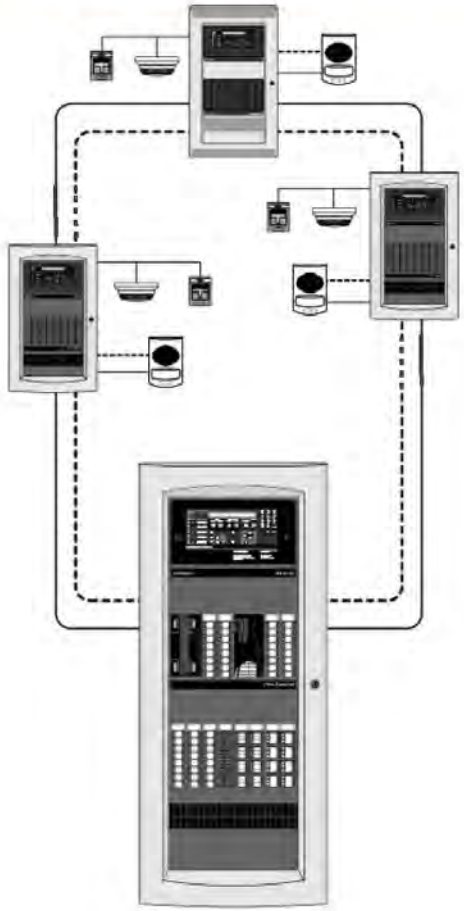
Workshop 5 – Systems

ADDRESSABLE FIRE ALARM SYSTEM

Fire Alarm System

- Fire Alarm Control Panel (notifier)
- Fire alarm Annunciator
- Pull Station
- Smoke Detector
- Addressable Mass-Notification-Speaker Strobe/Visual "ADA" Compliant Signal



Workshop 5 – Systems

INTEGRATED ELECTRONIC SECURITY SYSTEM

Security System Components

- Access Control amag
- CCTV
- Intrusion
- Integration
  - With each other
  - With other systems
  - Paging/Lighting

Security Cameras

Master Intercom Station

Exterior Intercom Station

Security Card Reader/Keypad

Sequence of operations of key elements

- Typical access control door
- Main Entrance
- CCTV video retrieval
- Intrusion system

Workshop 5 – Systems

BIO DIESEL GENERATOR

Load Breakdown for Life Safety Equipment:

•All Exit Signs and Emergency Lighting in the areas listed below
are fed by Life Safety Emergency Power

Load Breakdown for Optional Standby Equipment:

- Equipment listed below is fed by Optional Standby Power

1. heat pumps
2. Door Access Controls, Security System, CCTV
3. ATC Controls
4. Strategically located receptacles in the following areas. These receptacles will be RED in color

6. Electronic faucets and sinks (where applicable)
7. Heating and ventilation systems required for freeze protection
8. Cooling unit serving Head End room & IDF rooms.
9. Unit heater serving water service room.
10. Equipment within the Head End and IDF rooms including:
11. Fire alarm system (system also has full battery back-up)
12. Refrigeration

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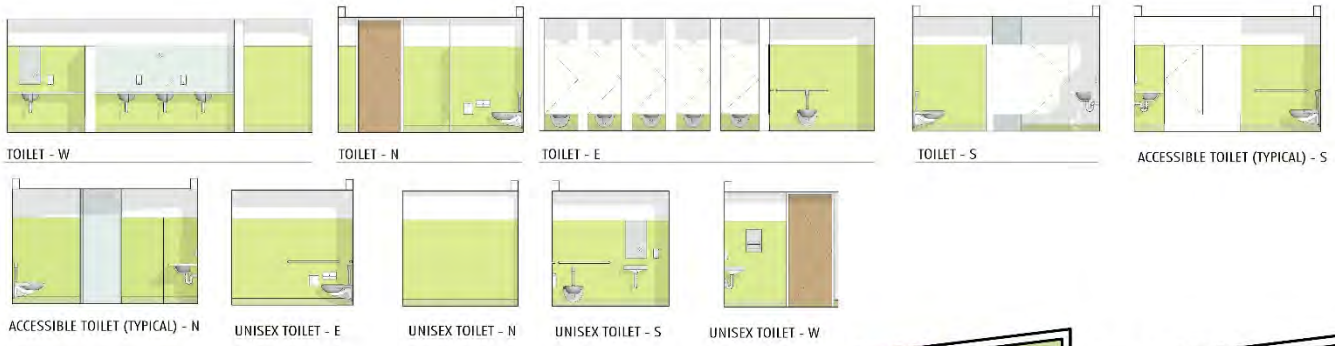
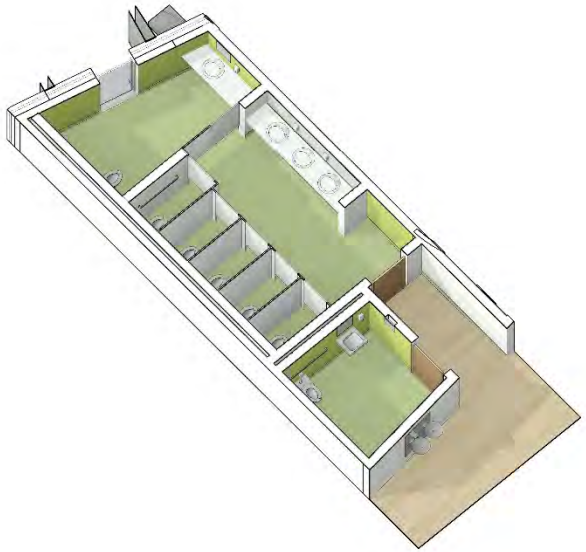
Agenda

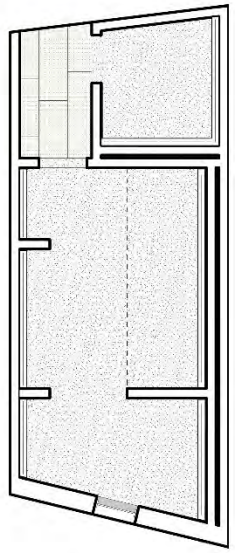
1. Sustainability
2. Systems – Electrical & Fire Protection
3. Toilets

Workshop 5 – Toilets





THIRD AND FOURTH FLOOR TOILETS - PLAN



THIRD AND FOURTH FLOOR TOILETS - RCP

TOILETS

0' 4' 8' 16' 32'

Jonathan Levi Architects

MARCH 30, 2020
DESIGN DEVELOPMENT WORKSHOP 5
DRISCOLL SCHOOL

Workshop 5 – Toilets


PRE-K/ K TOILET - N


PRE-K/ KTOILET - E


PRE-K/ K TOILET - W

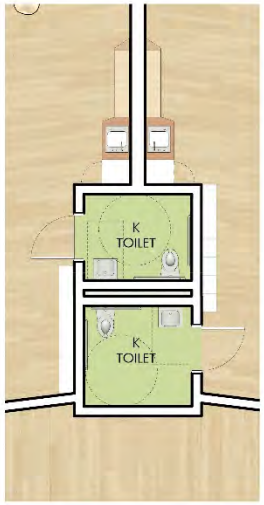

PRE-K/ K TOILET - S


1 AND 2 GRADE - N

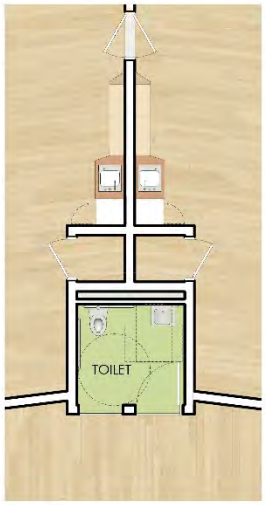

1 AND 2 GRADE - E


1 AND 2 GRADE - W


1 AND 2 GRADE - S



SECOND FLOOR PRE-K AND K TOILETS



SECOND FLOOR - GRADE 1 AND 2 TOILETS

TOILETS

0' 4' 8' 16' 32'

Jonathan Levi Architects

MARCH 30, 2020
DESIGN DEVELOPMENT WORKSHOP 5
DRISCOLL SCHOOL